Claims

What is claimed is:

1. A vertebral implant apparatus for interposition between two vertebral bodies, the device comprising:

a core member positioned between an outer body and an inner body, the outer body comprising a chamber for housing the core member and the inner body comprising a shaft extending at least partially into the chamber, wherein the outer body is movably engaged with the inner body; and

a first retention member on the outer body and a second retention member on the inner body, the first retention member cooperating with the second retention member to retain the shaft in the chamber;

wherein responsive to a load applied to the apparatus, the shaft slidably advances into the chamber to at least partially compress the core member between the outer and inner bodies.

2. The vertebral implant apparatus of claim 1 wherein a close fit between the core member and the chamber limits the at least partial compression of the core member.

3. The vertebral implant apparatus of claim 1 wherein the chamber has a geometry and wherein the at least partial compression of the core member deforms the core member into at least a portion of the geometry of the chamber.

4. A vertebral implant device for interposition between two vertebral bodies, the device comprising:

an outer body;

an inner body; and

a core member positioned between the outer body and the inner body, wherein the outer body is movably engaged with the inner body and wherein responsive to a load applied to the device, the outer and inner body at least partially compress the core member.

5. The vertebral implant device of claim 4 wherein the outer body comprises a chamber for housing the core member.

6. The vertebral implant device of claim 5 wherein the inner body comprises a shaft extending at least partially into the chamber.

7. The vertebral implant device of claim 6 wherein responsive to the load applied to the device, the shaft slidably advances into the chamber causing the at least partial compression of the core member.

8. The vertebral implant device of claim 4 wherein the outer body includes at least one slot and the inner body includes at least one tab, and wherein the tab movably engages the slot.

9. The vertebral implant device of claim 8 further comprising a longitudinal axis, wherein the slot extends longitudinally along the outer body and the tab translates within the slot for movably engaging the outer and inner bodies.

10. The vertebral implant device of claim 8 wherein the tab prevents the inner body from disengaging the outer body.

11. The vertebral implant device of claim 4 wherein the outer body and inner body each comprise a cavity for containing bone growth promoting material.

12. The vertebral implant device of claim 11 wherein the outer body and inner body each comprise one or more apertures in communication with the cavity.

13. The vertebral implant device of claim 4 wherein the outer body includes a longitudinal axis and an end portion extending at a non-perpendicular angle with respect to the longitudinal axis.

14. The vertebral implant device of claim 4 wherein the inner body includes a longitudinal axis and an end portion extending at a non-perpendicular angle with respect to the longitudinal axis.

15. The vertebral implant device of claim 4 wherein the outer body and the inner body each comprise surface roughening extending toward the corresponding vertebral bodies.

16. The vertebral implant device of claim 4 wherein the device includes a substantially oval cylindrical cross-section.

17. The vertebral implant device of claim 4 wherein the core member comprises one or more compartments.

18. The vertebral implant device of claim 4 wherein the core member comprises an elastomer.

19. The vertebral implant device of claim 18 wherein the elastomer comprises polyurethane.

20. The vertebral implant device of claim 18 wherein the elastomer comprises silicone.

21. The vertebral implant device of claim 18 wherein the elastomer comprises a copolymer of polyurethane and silicone.

22. The vertebral implant device of claim 18 wherein the elastomer comprises polyolefin rubber.

23. The vertebral implant device of claim 4 wherein the core member comprises a hydrogel.

24. The vertebral implant device of claim 23 wherein the hydrogel comprises a polyvinyl alcohol hydrogel.

25. The vertebral implant device of claim 23 wherein the hydrogel comprises a polyacrylonitrile-based hydrogel.

26. The vertebral implant device of claim 23 wherein the hydrogel comprises a polyacrylic-based hydrogel.

27. The vertebral implant device of claim 23 wherein the hydrogel comprises a polyurethane-based hydrogel.

28. The vertebral implant device of claim 4 wherein the core member comprises one or more polymers.

29. The vertebral implant device of claim 4 wherein the core member comprises one or more surface features for altering the response of the core member to the at least partial compression.

30. The vertebral implant device of claim 4 wherein the core member comprises one or more subsurface features for altering the response of the core member to the at least partial compression.

31. A vertebral implant device for interposition between two vertebral bodies, the device comprising:

first and second outer bodies;

a center shaft; and

first and second core members, wherein the first core member is positioned between the first outer body and the center shaft, and the second core member is positioned between the second outer body and the center shaft,

wherein the outer bodies are movably engaged with the center shaft and

wherein responsive to a load applied to the device, the outer bodies and the center shaft at least partially compress the core members.

32. The vertebral implant device of claim 31 further comprising a second center shaft and a third core member positioned between the first outer body and the first core member.

33. A method for installing a vertebral implant device between two vertebral bodies in a vertebral column, the method comprising:

positioning a core member within an outer body of the device;

movably engaging an inner body of the device with the outer body, wherein the core member is positioned between the inner body and the outer body;

compressing the device with an insertion instrument; and

positioning the device in the vertebral column guided by the insertion instrument.

34. The method of claim 33 further comprising:

removing the insertion instrument after the device is in position in the vertebral column, wherein the device expands to contact the adjacent bodies.

35. The method of claim 33 wherein the outer body and the inner body comprise grooves and the insertion instrument comprises prongs, and wherein the prongs engage the grooves for compressing the device.

36. The method of claim 33 further comprising:

placing bone growth promoting material into a cavity formed in each of the inner body and outer body.

37. A method for installing a vertebral implant device between two vertebral bodies in a vertebral column, the method comprising:

positioning a core member within an outer body of the device;

movably engaging an inner body of the device with the outer body, wherein the core member is positioned between the inner body and the outer body;

distracting the space between the two vertebral bodies; and

positioning the device in the vertebral column guided by an insertion instrument.

38. A kit having components for interposition between two vertebral bodies, the kit comprising:

a first outer body having a first chamber and a first retaining member;

a shaft having a second retaining member to moveably engage the first retaining member;

a first core member sized and shaped to occupy a portion of the first chamber.

39. The kit of claim 37 wherein the shaft further comprises a third retaining member and the kit further comprises:

a second outer body having a second chamber and a fourth retaining member to moveably engage the third retaining member; and

a second core member sized and shaped to occupy a portion of the second chamber.

40. A method for assembling modular members of a vertebral implant device, the method comprising:

providing at least one outer member with a cavity, at least one inner member with a shaft, and at least one core member;

inserting the at least one core member into the cavity;

inserting the shaft into the cavity to retain the at least one core, wherein the at least one outer member is movably engaged with the at least one inner member.

41. The method of claim 40 further comprising providing a plurality of core members.

42. The method of claim 40 further comprising providing a plurality of inner members.

43. The method of claim 40 further comprising providing a plurality of outer members.

44. The method of claim 40 wherein the assembly of the modular members occurs inside a surgical arena.

45. The method of claim 40 wherein the assembly of the modular members occurs in a factory.